



Course Title: PLC

Date: -4 -2016 (Midterm exam)

Course Code: CCE3223

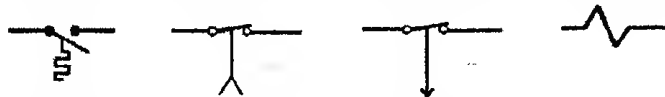
Allowed time: 1 hour

Year: 3rd

No. of Pages: (2)

Problem number (1) (10 Marks)

(a) Give a name for the following devices symbols and explain its usage.



- (b) What is meant by PLC and to what type of controllers it belongs to?
- (c) Explain the main differences between TON and RTO Timers.
- (d) Explain the operation cycle of PLCs.
- (e) Explain the timing parameters of PLCs timers.

Problem number (2) (10 Marks)

- a) Draw the suitable ladder diagram for a liquid filling and mixing system which mixes two liquids A and B as shown in Fig.1. These processes are sequentially done as in the following: (6 Marks)
- 1- When Start is pressed, at the first, the valve (Y0) opens to fill the container with liquid A until it reaches to level x1 (via limit switch).
 - 2- Then the valve (Y1) opens to fill the container with liquid B until it reaches to level x2 (via limit switch).
 - 3- The motor (M) starts the mixing process and the time for this process is 40 Sec.
 - 4- The valve (Y2) opens to drain out the mixture of the container and this process takes 50 Sec.
 - 5- Steps 1-4 are repeated until Stop is pressed.
- b) For the ladder diagram shown in Fig.2, draw the timing diagram to illustrate the states of T1, Accumulated time (AT) and Y. Consider the states of SW1 and SW2 as shown in Fig.3. (4 Marks)

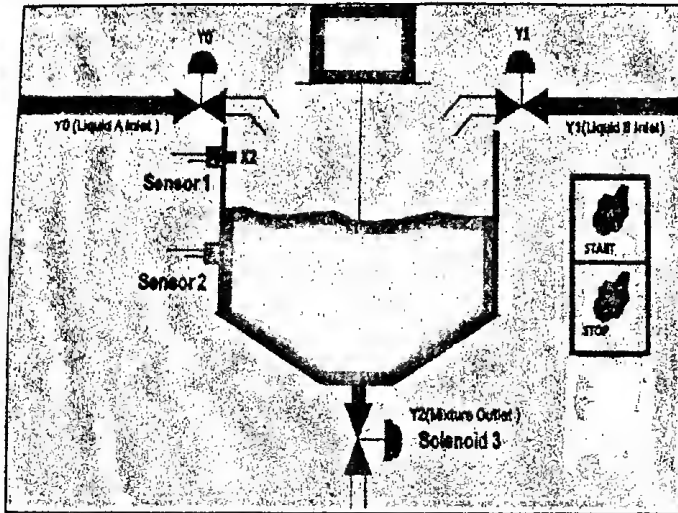


Fig.1

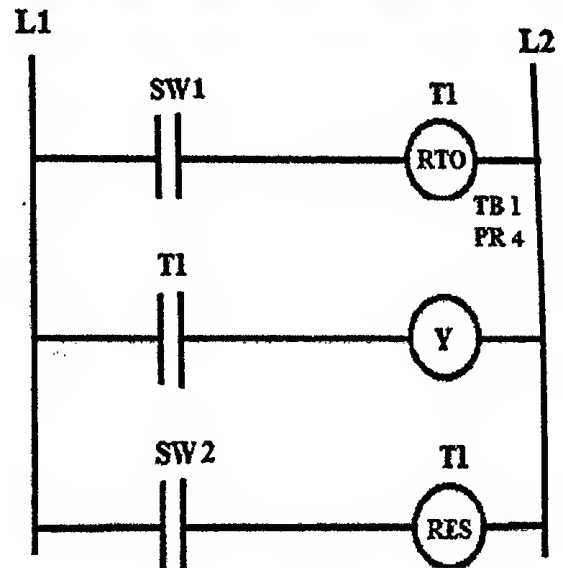


Fig.2

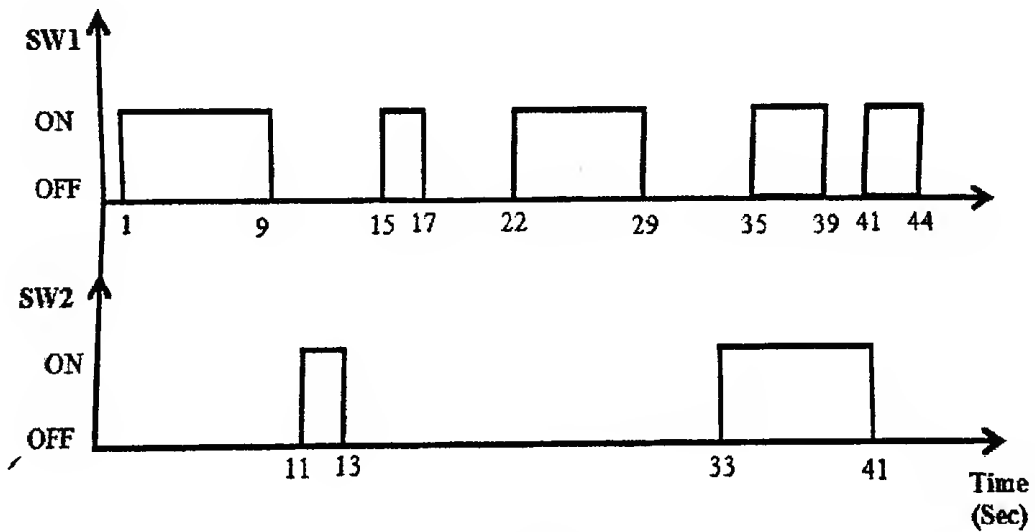


Fig.3

Good luck

Dr. M. Arafa